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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

BISSETT, MELANIE D

ART UNIT

PAPER NUMBER

1711

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Please find below and/or attached an Office communication concerning this application or proceeding.

47CT

Office Action Summary

Application No.

09/708,965

Applicant(s)

SHAH ET AL.

Examiner

Melanie Bagwell-Bissett

Art Unit

1711

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 18-24 is/are allowed.
- 6) ☒ Claim(s) 1-8 and 11-17 is/are rejected.
- 7) ☒ Claim(s) 9 and 10 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Summary of the Claims

1. Claim 1 is drawn to a process for sealing and insulating a fuel cell plate comprising providing a fuel cell plate, applying an infrared radiation- or heat-curable coating precursor on a surface of the fuel cell plate, and exposing the coating precursor to infrared radiation or heat.
2. Claim 6 is drawn to a process for sealing and insulating a fuel cell plate comprising providing a fuel cell plate, applying an infrared radiation-curable coating precursor on a surface of the fuel cell plate, and exposing the coating precursor to infrared radiation or heat, wherein the coating precursor includes an epoxy resin and an acrylonitrile butadiene copolymer.
3. Claim 15 is drawn to an insulated fuel cell plate comprising a plate and a solid epoxy nitrile resin coating on a surface of the plate.
4. Claim 18 is drawn to an insulated fuel cell plate comprising a plate and a coating precursor on the plate, where the coating precursor comprises an epoxy resin, an acrylonitrile butadiene copolymer, a thermoplastic film-former, a polyamine crosslinking agent, and a solvent.
5. Claim 2 limits the coating application method, claims 3-5 limit the radiation exposure step, claims 7-8 limit a crosslinking agent, claims 9-10 and 19 limit a thermoplastic component, claims 11-14 and 20-24 limit additional components, and claims 16-17 limit the coating thickness.

Double Patenting

6. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

7. Claims 1-5 and 15-17 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting over claims 1-2, 5, 8-10, 33, and 23-24 of copending Application No. 09/644,634. Although the conflicting claims are not identical, they are not patentably distinct from each other because:

8. Copending claim 1 discloses a process for sealing and insulating a fuel cell plate comprising providing a fuel cell plate and applying a radiation- or heat-polymerizable coating precursor to a surface of the plate, and exposing the coating precursor to radiation or heat to initiate polymerization. Although the claim does not mention "cross-linking" by radiation or heat, the term "polymerization" would include crosslinking reaction. Furthermore, although the claim does not specify infrared radiation, dependent claim 8 limits the precursor to be adapted to polymerize by infrared radiation. Thus, it would have been prima facie obvious to use infrared radiation or heat to

Art Unit: 1711

polymerize or crosslink the coating of copending claim 1 in the expectancy of beneficial results.

9. Copending claim 33 discloses an insulated fuel cell plate comprising a plate and a coating precursor applied thereon, where the coating precursor is an acrylate resin, an epoxy nitrile resin, or an organopolysiloxane resin. Although the scope of the claims differ, it is the examiner's position that it would have been prima facie obvious to choose epoxy nitrile resin for the coating precursor in the expectancy of beneficial results.

Furthermore, copending claims 23-24 specify coating thicknesses for insulated fuel cell coatings. It is the examiner's position that it would have been prima facie obvious to coat the epoxy nitrile resins of copending claim 33 at the specified thicknesses of copending claims 23-24 in the expectancy of beneficial results.

10. This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Claim Rejections - 35 USC § 102

11. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) do not apply to the examination of this application as the application

Art Unit: 1711

being examined was not (1) filed on or after November 29, 2000, or (2) voluntarily published under 35 U.S.C. 122(b). Therefore, this application is examined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

12. Claims 1 and 3-5 are rejected under 35 U.S.C. 102(e) as being anticipated by Ying et al.

13. Ying discloses a protective coating for separators in electrochemical cells, where a protective coating is applied to a microporous layer (abstract). The coating may be coated and cured by heat, UV light, visible light, infrared radiation, and electron beam radiation (col. 7 lines 48-55), and the separators may be used in fuel cell applications (col. 11 lines 9-15). Ying teaches combining an ethoxylated diacrylate with a urethane acrylate and a photosensitizer, coating the mixture at a thickness of 4 microns onto a substrate, and exposing the coating to UV lamps for 30 seconds to cure (example 1). Since the microporous layers are thin layers of metal oxide material (col. 19 lines 6-17), it is the examiner's position that the microporous layers of Ying's invention would read on a "plate". Further, since the separators of the invention are useful in fuel cell applications, it is the examiner's position that Ying's reference teaches fuel cell plates and processes of making.

14. Claims 1 and 4-5 are rejected under 35 U.S.C. 102(e) as being anticipated by Sasaki et al.

15. Sasaki discloses sealants for fuel cells which are applied to a porous carbon plate (col. 3 lines 28-32) and heated to cure the sealant layer (embodiment 1). The

Art Unit: 1711

plates are exposed to radiation for less than 30 minutes, since radiation is not used to cure the sealant layers. Embodiment 1 shows a coating thickness of 0.25 mm (250 μm), thus teaching a coating precursor of *less than about* 250 μm .

Claim Rejections - 35 USC § 103

16. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

17. Claims 15-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sasaki et al. in view of Giordano, Jr. et al.

18. Sasaki applies as above for a fuel cell plate having a sealant layer applied thereon. However, Sasaki does not teach the use of epoxy nitrile resins. Giordano, Jr. teaches the conventionality of using epoxy nitrile resins as coatings on various substrates to form layers having corrosion resistance and having no pinholes or voids (col. 2 lines 19-22). The coatings have superior barrier properties, appearance, and adhesion (col. 1 lines 11-18). The coatings can be used in electrical equipment and may also be used as sealants (col. 2 lines 60-68). Examples show thermally cured epoxy nitrile resin coatings at a thickness of about 2.0 mil ($\sim 50 \mu\text{m}$). Sasaki notes the need for sealant layers that do not leak fuel (col. 1 lines 57-64). Thus, it is the examiner's position that it would have been prima facie obvious to choose epoxy nitrile

Art Unit: 1711

resins for sealant layers of Sasaki's invention to provide pinhole-free coatings having improved barrier properties.

19. Claims 6-8 and 11-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sasaki et al. in view of Siebert, as evidenced by Stucke.

20. Sasaki applies as above, failing to mention the use of infrared-curable sealant materials comprising epoxy resin and acrylonitrile butadiene copolymer. Siebert teaches the use of compositions comprising epoxy resin, polybutadiene-acrylonitrile rubber, and an amine crosslinking agent (example 1), where the mixture is cast onto a substrate and thermally cured (col. 7 lines 33-50). The compositions can be used as castable gaskets, seals, and o-rings (col. 7 lines 51-57). Siebert notes the use of colorants (col. 7 lines 15-19) and aromatic liquid compounds (col. 5 lines 22-40), thus teaching the use of solvents. Since infrared radiation is conventionally used as a heating method for crosslinking epoxy resins in short amounts of time (Stucke, abstract), it is the examiner's position that the epoxy resin of Siebert's invention is inherently adapted to crosslink in response to infrared radiation. It is the examiner's position that it would have been prima facie obvious to use the epoxy coatings of Siebert's invention as gaskets in Sasaki's invention, since the epoxy compositions of Siebert's invention are castable and hence more easily applied.

Art Unit: 1711

21. Claims 13-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sasaki et al. in view of Siebert as evidenced by Stucke as applied to claims 6-8 and 11-12 above, and further in view of Ciba-Giegy.

22. The cited references apply as above, failing to mention the use of air-release agents and slip aids. Ciba-Giegy shows the conventionality of adding such components to an epoxy coating composition (p. 3 line 57-p. 4 line 4). Since Siebert suggests that conventional additives may be added to the epoxy composition of the invention, it is the examiner's position that it would have been prima facie obvious to add slip aids and air-release agents to optimize coating appearance and processing.

23. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sasaki et al. in view of Canfield.

24. Sasaki applies as above for the process of sealing a fuel cell plate, failing to mention the application of the coating by screen printing. However, Canfield shows the conventionality of screen printing a gasket onto a fuel cell plate (Figure 6, col. 4 lines 40-51). It is the examiner's position that it would have been prima facie obvious to use a screen printing technique to apply the gasket layer of Sasaki's invention to provide a patterned discontinuous gasket layer in the expectancy of beneficial results.

Allowable Subject Matter

25. Claims 18-24 are allowed.

Art Unit: 1711

26. Claims 9-10 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

27. The following is a statement of reasons for the indication of allowable subject matter:

28. The closest prior art, Siebert, discloses the use of compositions comprising epoxy resin, polybutadiene-acrylonitrile rubber, and an amine crosslinking agent, where the mixture is cast onto a substrate and thermally cured. The compositions can be used as castable gaskets, seals, and o-rings. However, the reference does not teach the addition of a thermoplastic resin and further does not teach the compositions applied to fuel cells. Therefore, it is the examiner's position that the use of the applicant's claimed coatings including thermoplastic resins for fuel cell applications is novel and unobvious over the closest prior art.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Melanie Bagwell-Bissett whose telephone number is (703) 308-6539. The examiner can normally be reached on M-F 8-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, James Seidleck can be reached on (703) 308-2462. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Art Unit: 1711

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

mdb
July 1, 2002



James J. Seidleck
Supervisory Patent Examiner
Technology Center 1700